



Assignment Sheet / Density Test

Project Number : 23502-ZS9
Project Name : HSR
Date Drilled : 9/3/13

Lab. Tech : K. Ford
Date Completed : 10/2/13
Boring : S0031R

Notes:

CHEM	Sulfate/Chloride	MR	Minimum Resistivity
COLL	Collapse	PH	pH Test
CONSOL	1D Consolidation	PI	Atterberg Limits
CURV	Modified Proctor	RV	R-value
DD	Moisture Density	SA	Sieve Analysis
DS	Direct Shear	TRX	Triaxial Compression
HY	Hydrometer		



Assignment Sheet / Density Test

Project Number : 23502-ZS9 Lab. Tech : K. Ford
Project Name : HSR Date Completed : 1/20/14
Date Drilled : 1/8/14

Notes:

CHEM	Sulfate/Chloride	MR	Minimum Resistivity
COLL	Collapse	PH	pH Test
CONSOL	1D Consolidation	PI	Atterberg Limits
CURV	Modified Proctor	RV	R-value
DD	Moisture Density	RVT	R-value Treated
DS	Direct Shear	SA	Sieve Analysis
HY	Hydrometer	TRX	Triaxial Compression



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Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	S. Alvarez
		Date:	9/18/2013
TES#:	23502-ZS9	Sample No.:	B01
Boring #:	S0031R; 0-5'	Classification:	(SP) Poorly Graded Sand

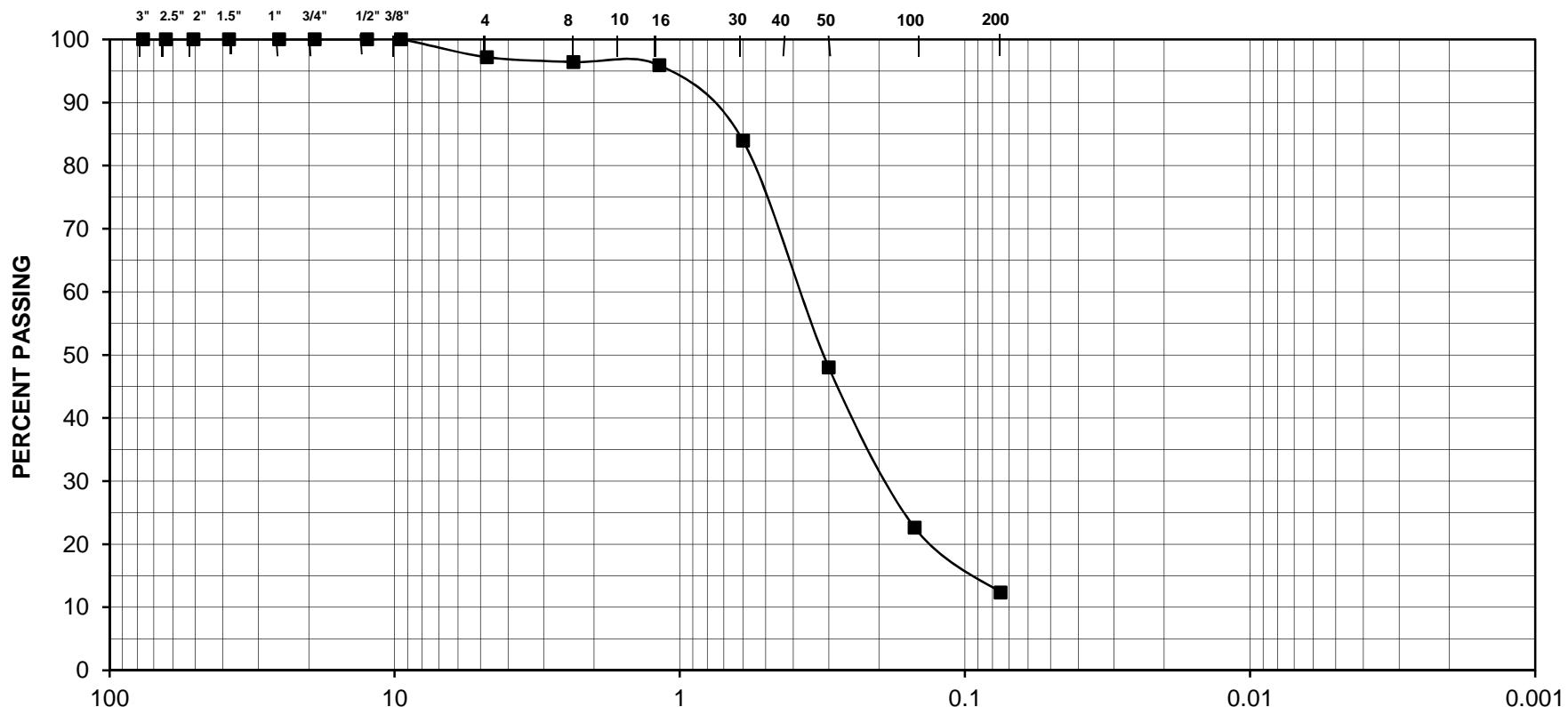
	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	195.0	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	195	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	170.9	2"	44.0 (20.0)

Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	5.5	0.0	2.8	97.2	
#8	7.0	1.5	3.6	96.4	
#16	8.0	1.0	4.1	95.9	
#30	31.3	23.3	16.1	83.9	
#50	101.4	70.1	52.0	48.0	
#100	150.9	49.5	77.4	22.6	
#200	170.9	20.0	87.6	12.4	
Pan	170.9				



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS



B01



Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford
		Date:	9/10/2013
TES#:	23502-ZS9	Sample No.:	SS02
Boring #:	S0031R; 6-6.5'	Classification:	(SP) Poorly Graded Sand

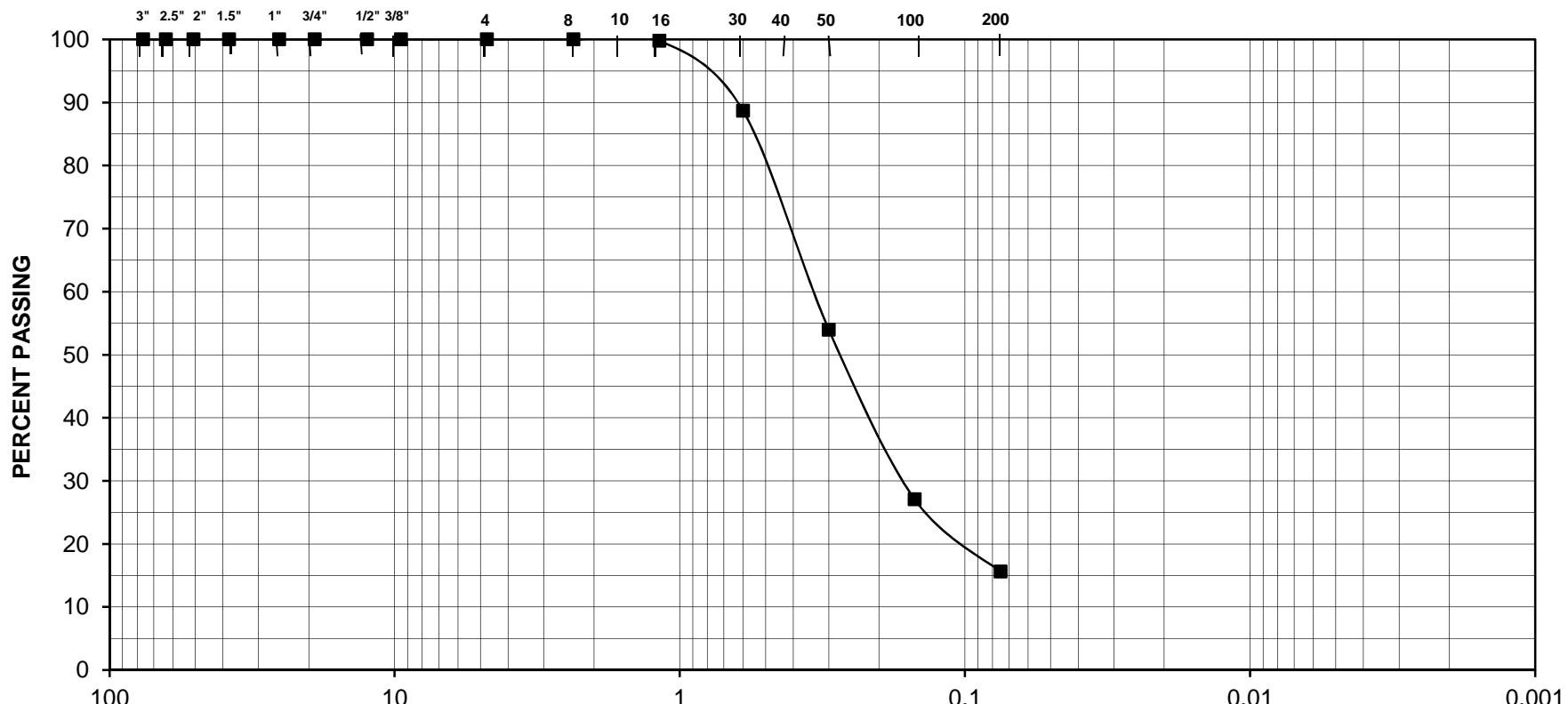
	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	183.2	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	183.2	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	157.1	2"	44.0 (20.0)

Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.4	0.4	0.2	99.8	
#30	20.7	20.3	11.3	88.7	
#50	84.3	63.6	46.0	54.0	
#100	133.6	49.3	72.9	27.1	
#200	154.6	21.0	84.4	15.6	
Pan	157.1				



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

— ■ SS02



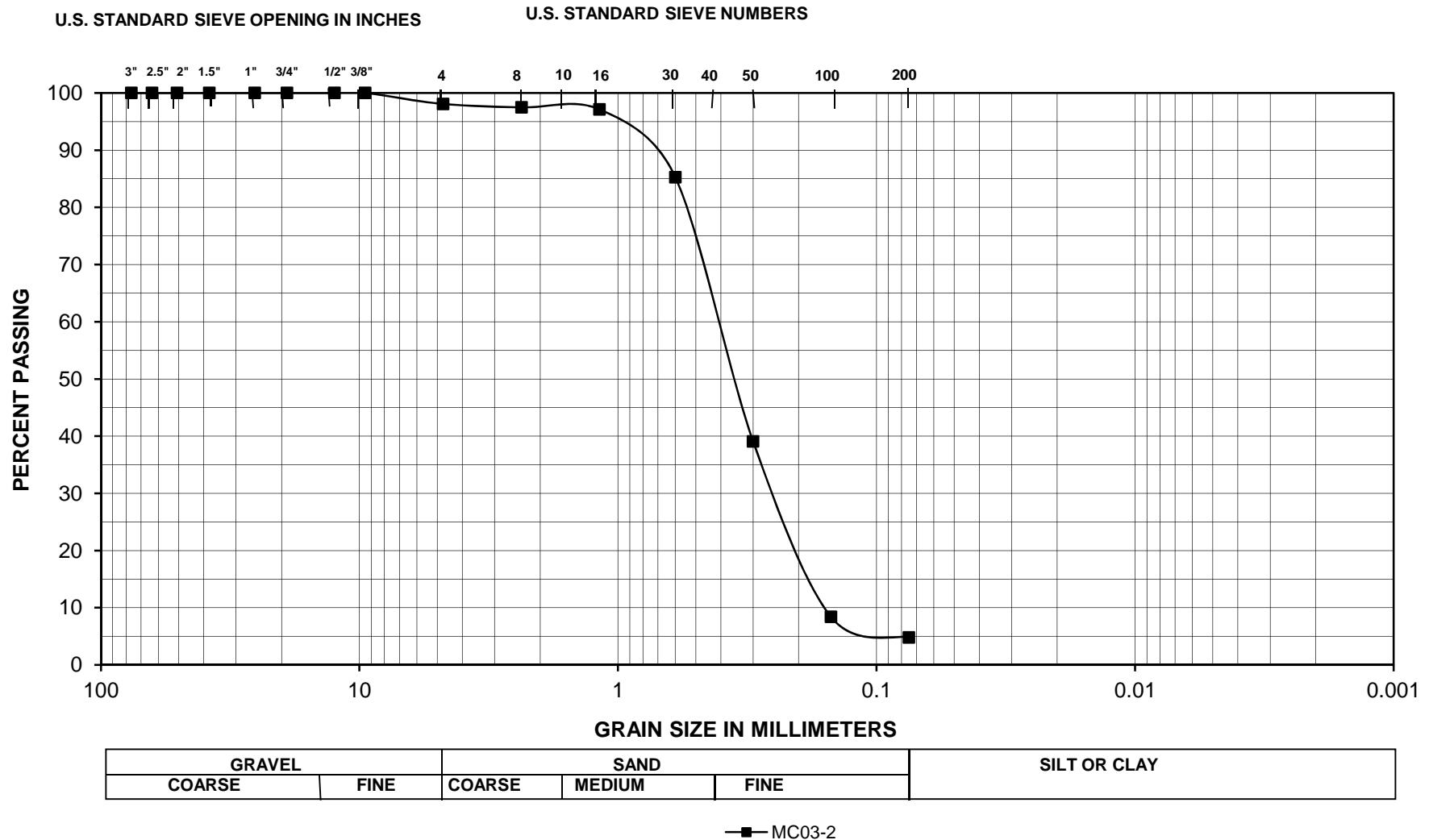
Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford
TES#:	23502-ZS9	Date:	1/16/2014
Boring #:	S0031R; 10.5-11'	Sample No.:	MC03-2
		Classification:	(SP) Poorly Graded Sand

	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	166.5	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	166.5	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	159.4	2"	44.0 (20.0)

Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	3.2	0.0	1.9	98.1	
#8	4.2	1.0	2.5	97.5	
#16	4.8	0.6	2.9	97.1	
#30	24.5	19.7	14.7	85.3	
#50	101.4	76.9	60.9	39.1	
#100	152.5	51.1	91.6	8.4	
#200	158.5	6.0	95.2	4.8	
Pan	159.4				





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Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford
		Date:	9/16/2013
TES#:	23502-ZS9	Sample No.:	SS04
Boring #:	S0031R; 16-16.5'	Classification:	(SP) Poorly Graded Sand

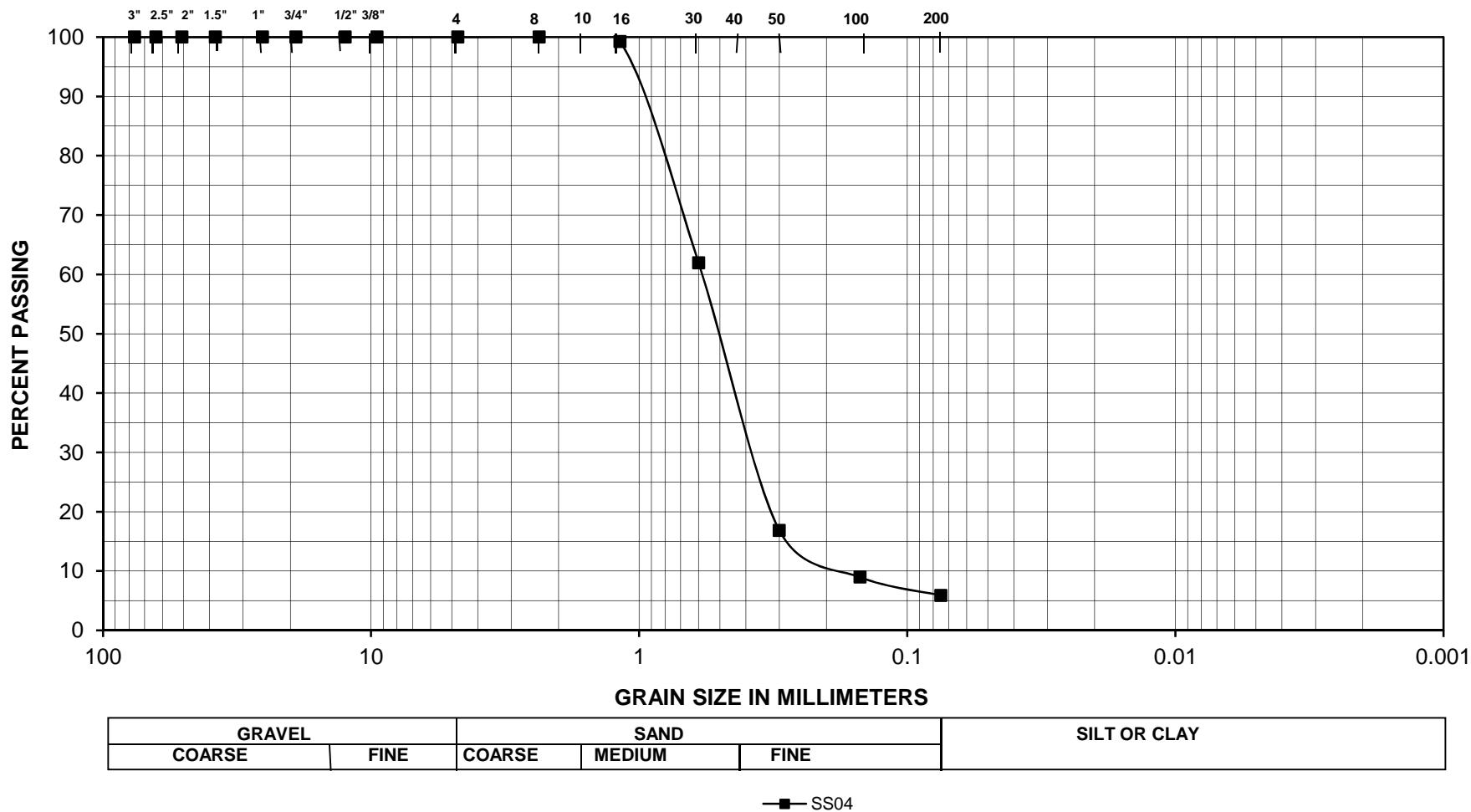
	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	172.6	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	172.6	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	162.9	2"	44.0 (20.0)

Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	1.3	1.3	0.8	99.2	
#30	65.7	64.4	38.1	61.9	
#50	143.5	77.8	83.1	16.9	
#100	157.1	13.6	91.0	9.0	
#200	162.4	5.3	94.1	5.9	
Pan	162.9				



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS





Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford
		Date:	9/16/2013
TES#:	23502-ZS9	Sample No.:	SS06
Boring #:	S0031R; 26-26.5'	Classification:	(SP) Poorly Graded Sand

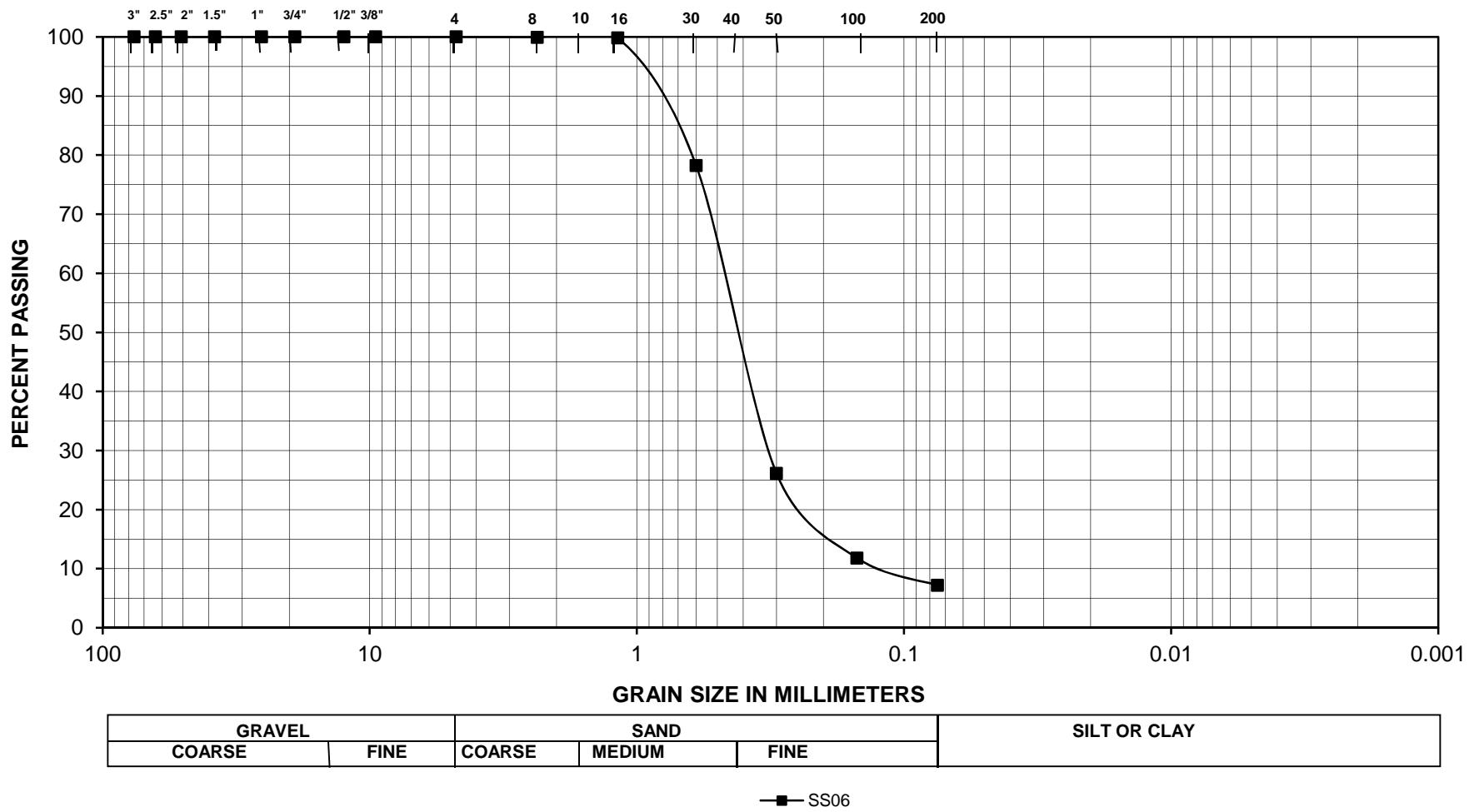
	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	169.2	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	169.2	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	157.8	2"	44.0 (20.0)

Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.1	0.1	0.1	99.9	
#16	0.3	0.2	0.2	99.8	
#30	36.8	36.5	21.7	78.3	
#50	125.0	88.2	73.9	26.1	
#100	149.2	24.2	88.2	11.8	
#200	157.0	7.8	92.8	7.2	
Pan	157.8				



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS





Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford
		Date:	9/16/2013
TES#:	23502-ZS9	Sample No.:	MC07-2
Boring #:	S0031R; 30.5-31'	Classification:	(SM) Silty Sand

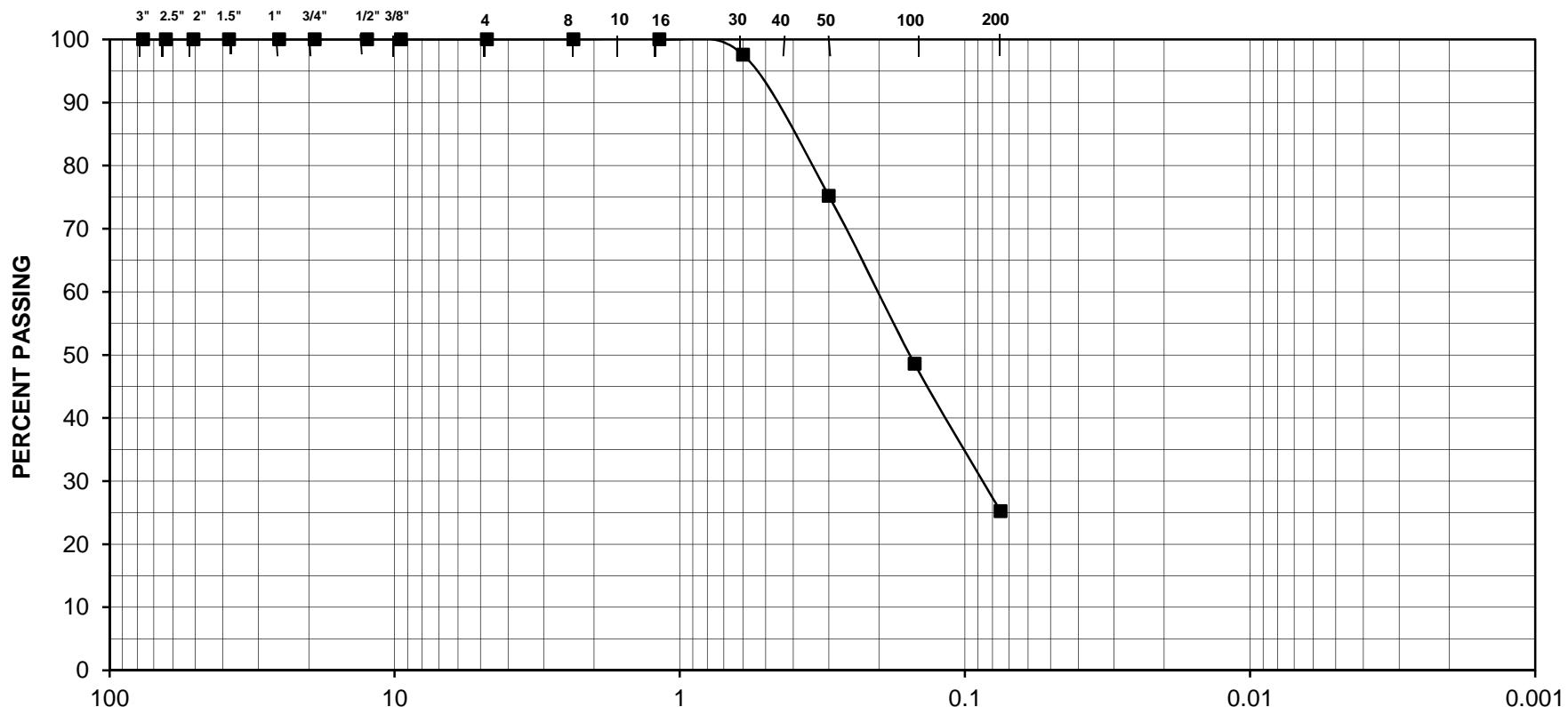
	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	173.9	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	173.9	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	136.4	2"	44.0 (20.0)

Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.0	0.0	0.0	100.0	
#30	4.2	4.2	2.4	97.6	
#50	43.1	38.9	24.8	75.2	
#100	89.4	46.3	51.4	48.6	
#200	130.0	40.6	74.8	25.2	
Pan	136.4				



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

— MC07-2



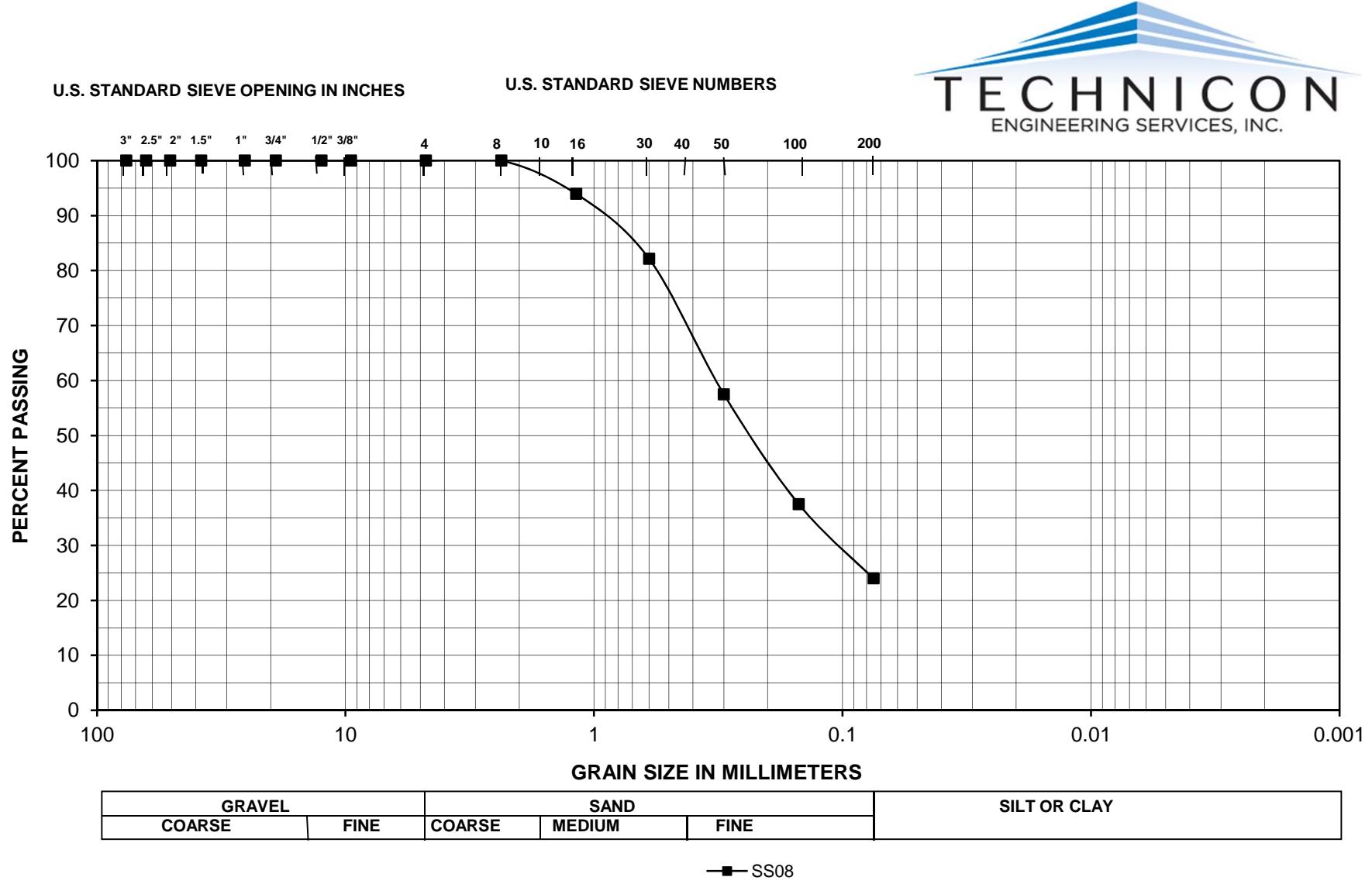
Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford
TES#:	23502-ZS9	Date:	1/16/2014
Boring #:	S0031R; 35-36.5'	Sample No.:	SS08
		Classification:	(SM) Silty Sand

	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	175.4	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	175.4	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	138.8	2"	44.0 (20.0)

Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	10.6	10.6	6.0	94.0	
#30	31.3	20.7	17.8	82.2	
#50	74.6	43.3	42.5	57.5	
#100	109.6	35.0	62.5	37.5	
#200	133.3	23.7	76.0	24.0	
Pan	138.8				





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Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford
TES#:	23502-ZS9	Date:	9/16/2013
Boring #:	S0031R; 41-41.5'	Sample No.:	MC09-1
		Classification:	(SM) Silty Sand

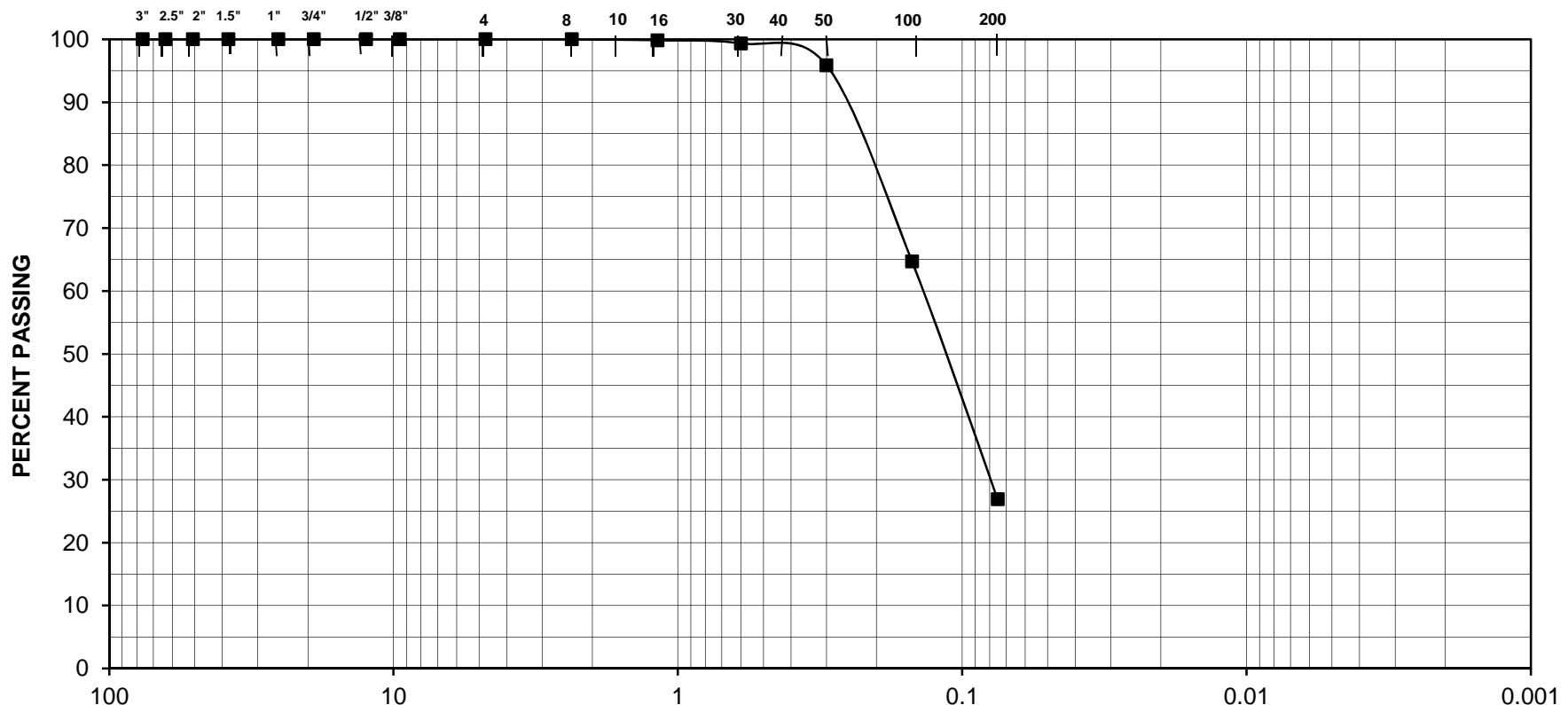
	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	184.1	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	184.1	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	152.7	2"	44.0 (20.0)

Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.3	0.3	0.2	99.8	
#30	1.2	0.9	0.7	99.3	
#50	7.6	6.4	4.1	95.9	
#100	65.0	57.4	35.3	64.7	
#200	134.6	69.6	73.1	26.9	
Pan	152.7				



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

— MC09-1



Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford
		Date:	9/16/2013
TES#:	23502-ZS9	Sample No.:	MC11-1
Boring #:	S0031R; 51-51.5'	Classification:	(SP) Poorly Graded Sand

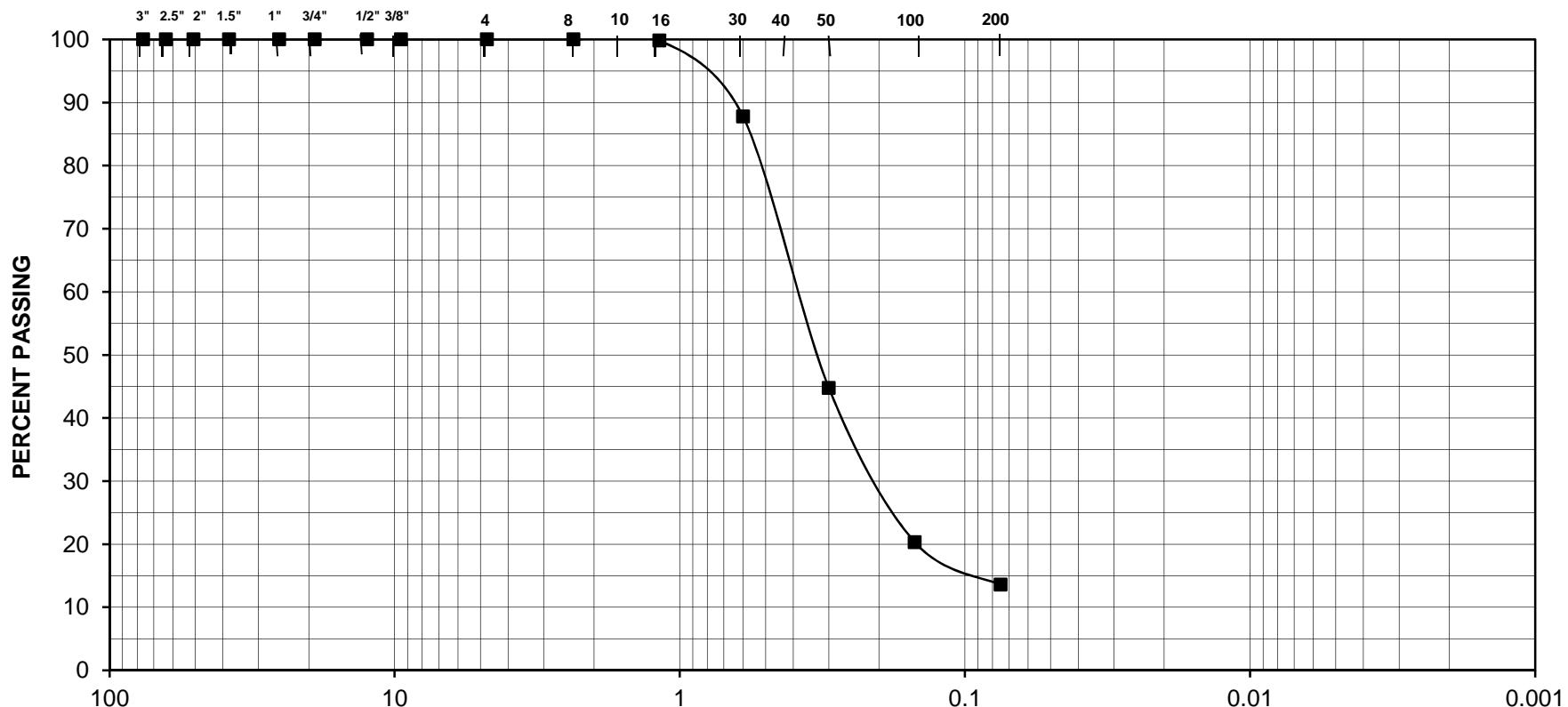
	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	186.9	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	186.9	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	163.8	2"	44.0 (20.0)

Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.3	0.3	0.2	99.8	
#30	22.8	22.5	12.2	87.8	
#50	103.2	80.4	55.2	44.8	
#100	148.9	45.7	79.7	20.3	
#200	161.5	12.6	86.4	13.6	
Pan	163.8				



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

MC11-1



Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford
		Date:	9/16/2013
TES#:	23502-ZS9	Sample No.:	MC13-1
Boring #:	S0031R; 61-61.5'	Classification:	(SP) Poorly Graded Sand

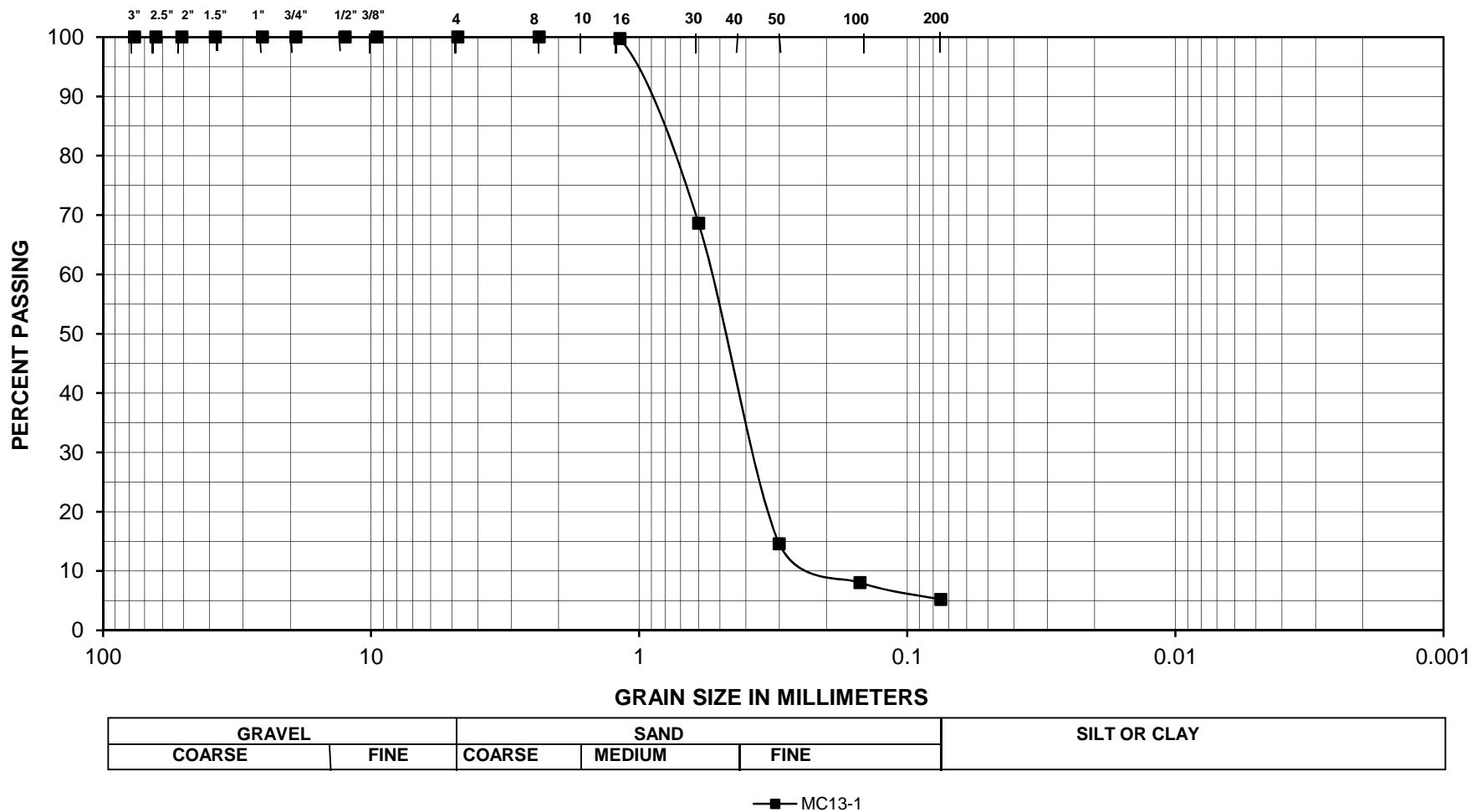
	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	120.4	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Aggregate Before Wash	120.4	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Aggregate After Wash	114.2	2"	44.0 (20.0)

Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#16	0.3	0.3	0.2	99.8	
#30	37.8	37.5	31.4	68.6	
#50	102.8	65.0	85.4	14.6	
#100	110.7	7.9	91.9	8.1	
#200	114.1	3.4	94.8	5.2	
Pan	114.2				



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS





Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil and Fine Aggregate

Project:	CA HSR FRE_BAK	Technician:	K. Ford
		Date:	9/16/2013
TES#:	23502-ZS9	Sample No.:	SS16
Boring No.:	S0031R	Remarks:	(SM/ML) Silty Sand

	Weight (grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	102.1	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Soil Before Wash	102.1	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Soil After Wash	59.8	2"	44.0 (20.0)

Sieve Size	Individual Weight Retained	Individual % Retained	Combined % Retained	Combined % Passing	Specs.
3 in.	0.0	0.0	0.0	100.0	
2 1/2 in.	0.0	0.0	0.0	100.0	
2 in.	0.0	0.0	0.0	100.0	
1 1/2 in.	0.0	0.0	0.0	100.0	
1 in.	0.0	0.0	0.0	100.0	
3/4 in.	0.0	0.0	0.0	100.0	
1/2 in.	0.0	0.0	0.0	100.0	
3/8 in.	0.0	0.0	0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#10	0.0	0.0	0.0	100.0	
#16	0.2	0.2	0.2	100.0	
#30	0.2	0.2	0.4	99.6	
#40	1.7	1.7	2.1	97.9	
#50	0.8	0.8	2.8	97.2	
#100	9.9	9.7	12.5	87.5	
#200	37.9	37.1	49.6	50.4	
Pan					

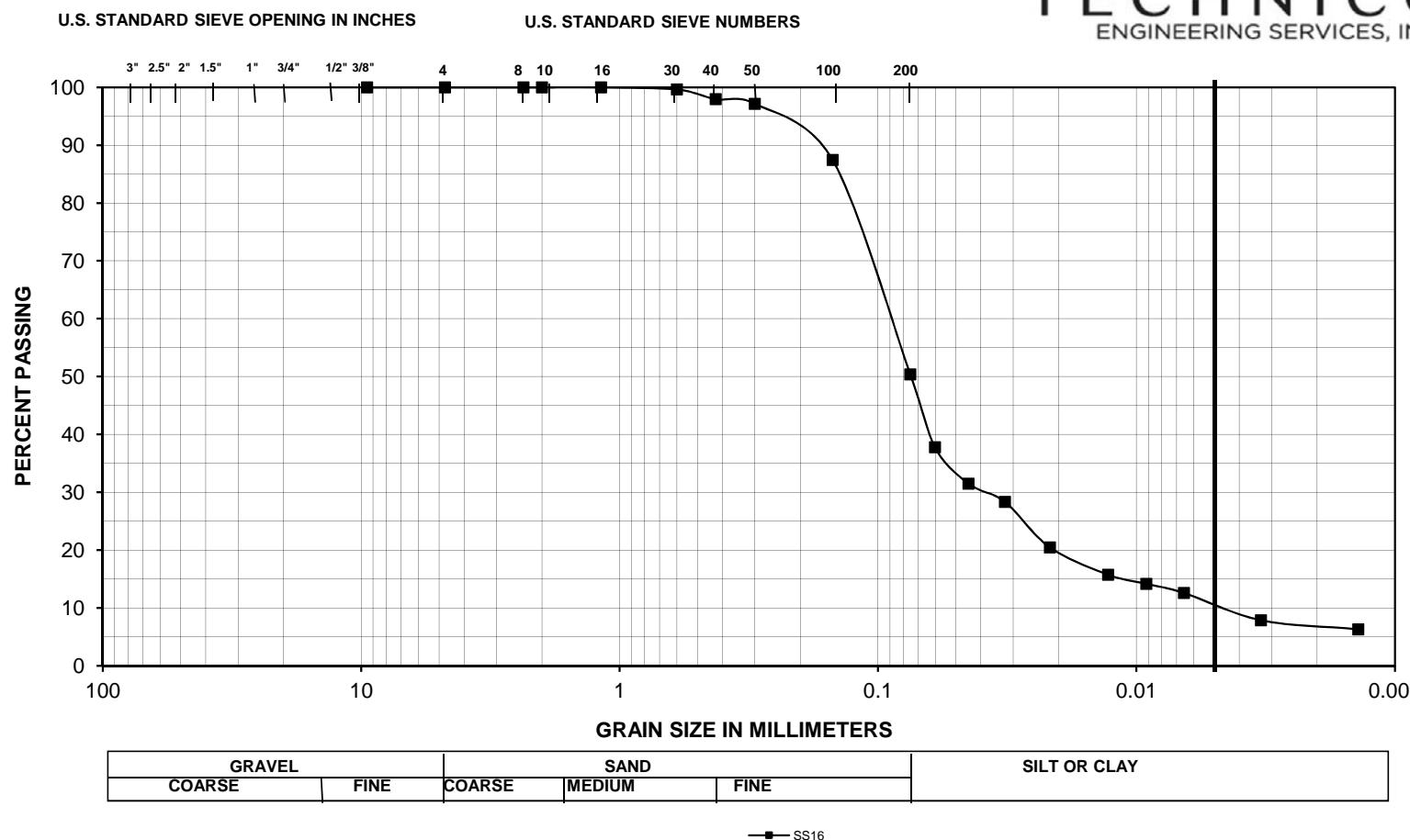


*Construction Testing & Inspection * Geotechnical & Environmental Engineering*

HYDROMETER TEST DATA SUMMARY

ASTM D 422-63

PROJECT:	CA HSR FRE_BAK			TES # :	23502-ZS9			
Boring Number	S0031R			DATE:	9/16/2013			
Sample Depth, ft	41-41.5'			Sample No.:	SS16			
			TESTED BY: K. Ford					
Mass of Test Sample, g	102.56		"air-dried"	Hydrometer Type 151H				
Mass of Hygroscopic Sample, g	48.50		"air-dried"					
Mass of Hygroscopic Sample, g	48.29		"oven-dried"	Specific Gravity of Test Material		2.650		
Mass of Test Sample, g	102.12		"oven-dried"	Specific Gravity of Test Solution		Varies		
Time (min.)	Hydrometer Reading	Corrected Reading	Temperature Degrees C	Effective Depth Table 2 (cm)	Constant, K Table 3	Diameter, D (mm)	Amt. Suspended, P (%)	
0.5	1.026	1.024	21	10.0	0.01348	0.0603	37.8	
1	1.022	1.020	21	11.0	0.01348	0.0447	31.5	
2	1.020	1.018	21	11.5	0.01348	0.0323	28.3	
5	1.015	1.013	21	12.9	0.01348	0.0217	20.5	
15	1.012	1.010	21	13.7	0.01348	0.0129	15.7	
30	1.011	1.009	21	13.9	0.01348	0.0092	14.2	
60	1.010	1.008	21	14.2	0.01348	0.0066	12.6	
250	1.007	1.005	21	15.0	0.01348	0.0033	7.9	
1440	1.006	1.004	21	15.2	0.01348	0.0014	6.3	
2880	1.006	1.004	21	15.2	0.01348	0.0010	6.3	

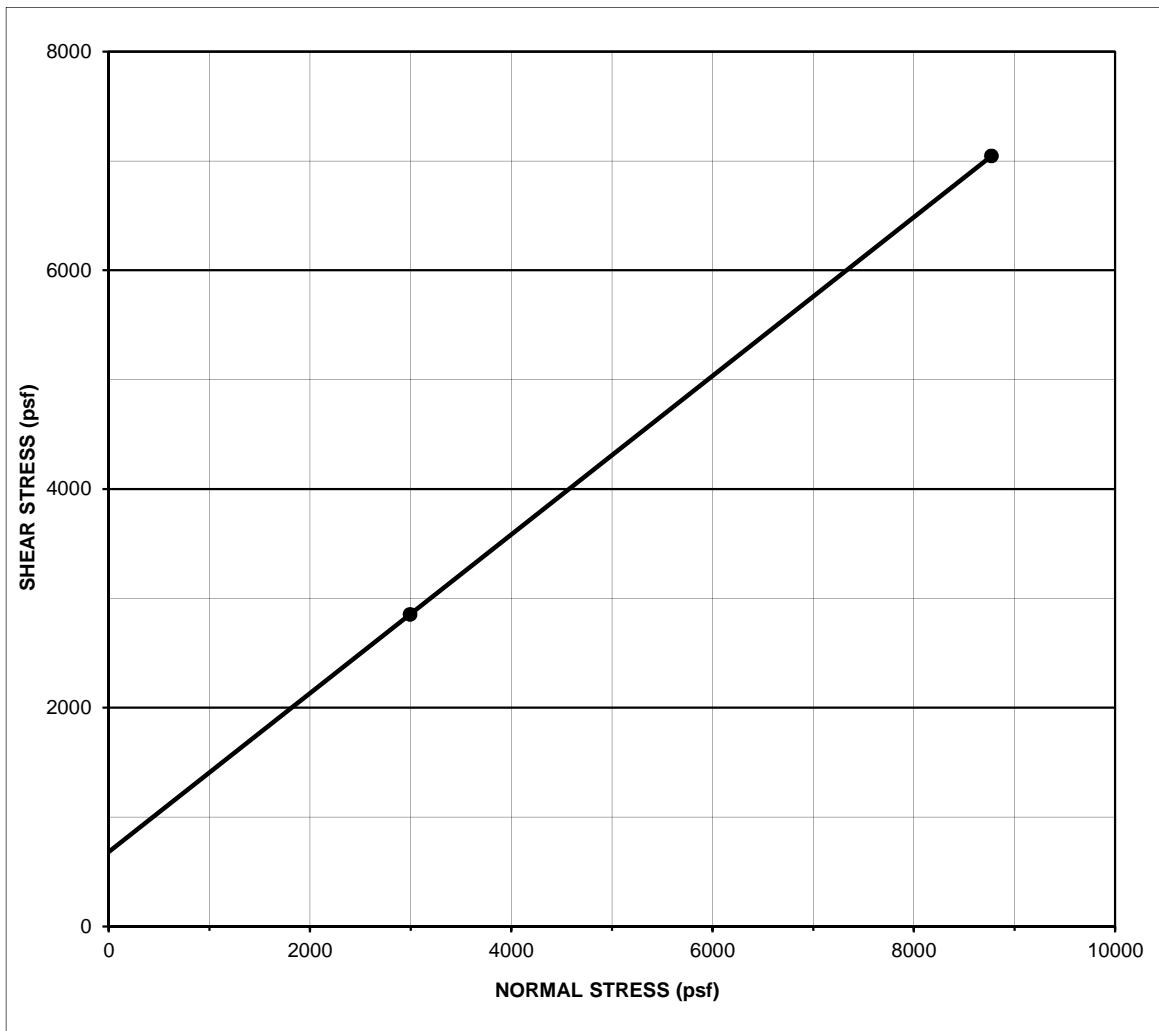


Sample #	Classification	% Gravel	% Sand	% Silt	% Clay*	% Moist.	LL	PL	PI	Project:	CA HSR FRE_BAK
SS16	(SM/ML) Silty Sand	0	49.6	40.4	10.0	0.4				TES#:	23502-ZS9
										Boring#:	S0031R
										Date:	9/16/2013

* Particles smaller than 5 Micron in diameter



Direct Shear Test
ASTM D3080



PROJECT:	HSR
TES NO.:	23502-ZS9
SAMPLE DATE.:	9/13/2013
BORING NO.:	S0031R
SAMPLE NO.:	MC05-1 Depth(21'-21.5')
DESCRIPTION:	Fine Sand (SP)

Cohesive Pressure, psf	680
Internal Friction Angle	36

SPECIMEN	A	B	C	D	E
DRY DENSITY (pcf)	98.9	Disturbed	98.9	---	---
INITIAL WATER CONTENT (%)	14.0		14.0	---	---
FINAL WATER CONTENT (%)	6.50		13.80	---	---
NORMAL STRESS (psf)	2995		8772	---	---
NORMAL STRESS (psi)	20		60	---	---
MAXIMUM SHEAR (psf)	2852		7047	---	---

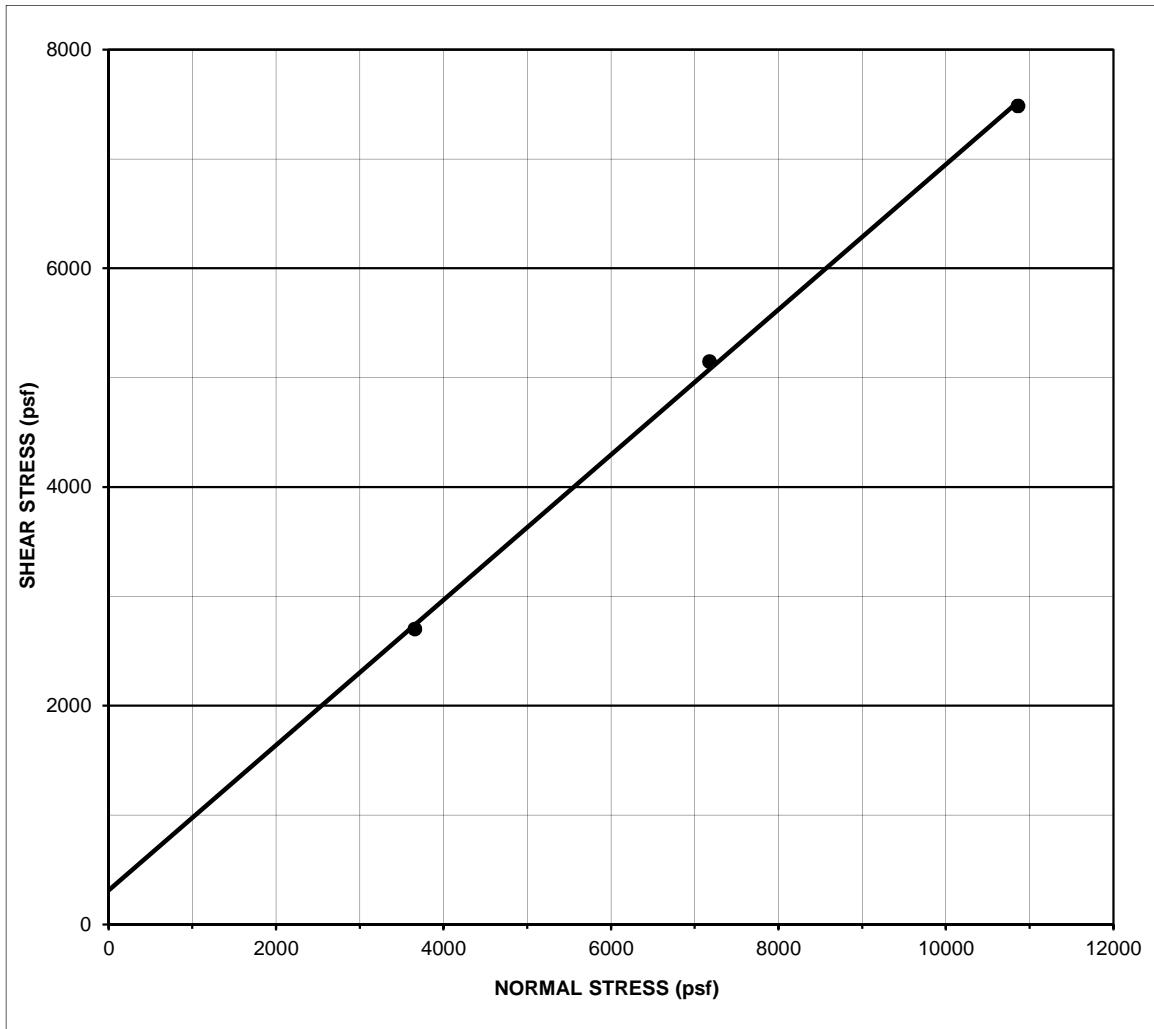
Engineering Materials Laboratory

4539 N. Brawley #108, Fresno, CA 93722

559-276-9311



Direct Shear Test
ASTM D3080



PROJECT:	HSR
TES NO.:	23502-ZS9
SAMPLE DATE.:	9/13/2013
BORING NO.:	S0031R
SAMPLE NO.:	MC11-1 Depth(51'-51.5')
DESCRIPTION:	Fine Sand (SP)

Cohesive Pressure, psf	310
Internal Friction Angle	34

SPECIMEN	A	B	C	D	E
DRY DENSITY (pcf)	105.8	105.8	105.8	---	---
INITIAL WATER CONTENT (%)	7.0	07.0	7.0	---	---
FINAL WATER CONTENT (%)	24.60	22.80	23.10	---	---
NORMAL STRESS (psf)	3656	7177	10863	---	---
NORMAL STRESS (psi)	25	50	75	---	---
MAXIMUM SHEAR (psf)	2702	5147	7486	---	---

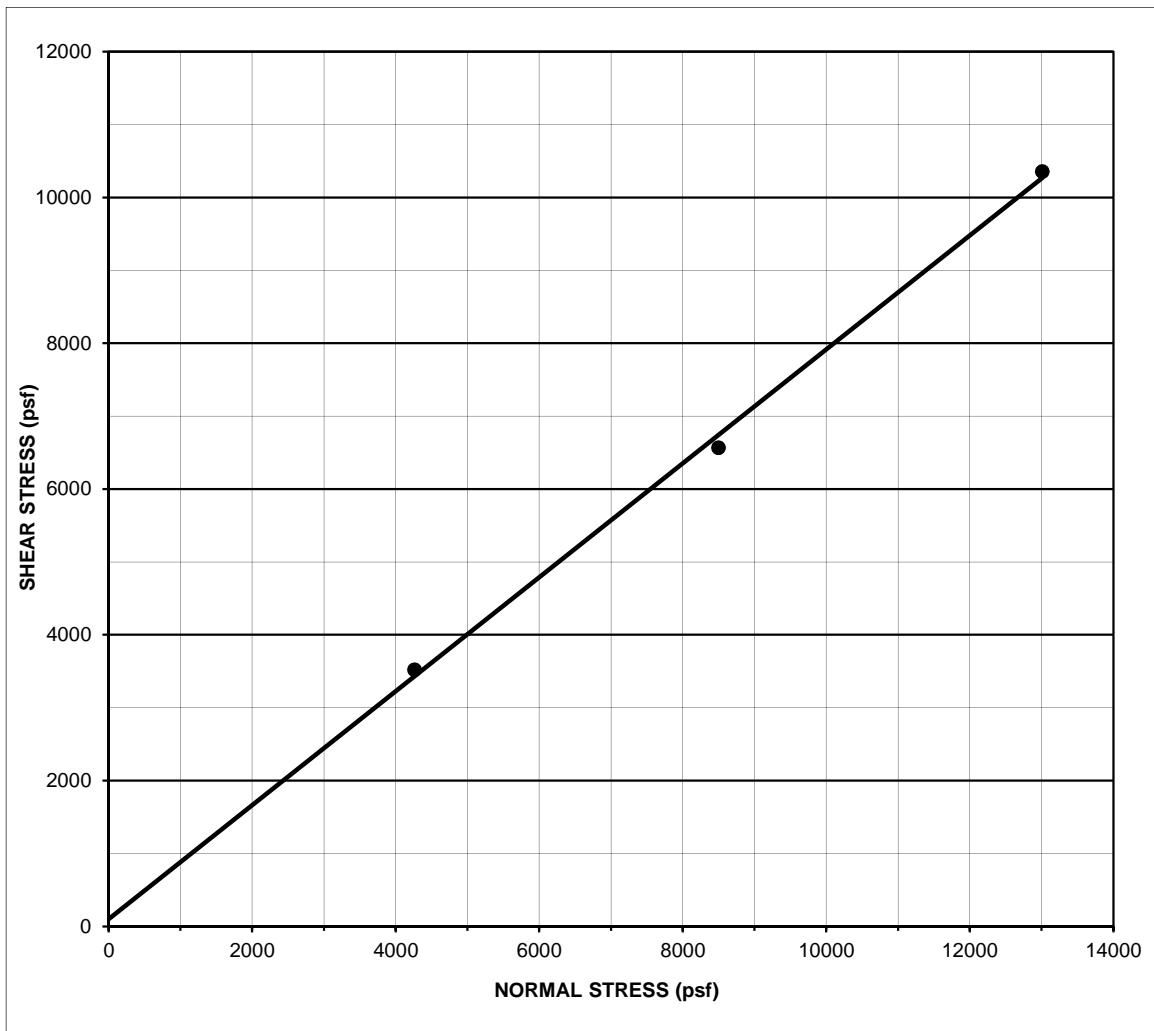
Engineering Materials Laboratory

4539 N. Brawley #108, Fresno, CA 93722

559-276-9311



Direct Shear Test
ASTM D3080



PROJECT:	HSR
TES NO.:	23502-ZS9
SAMPLE DATE.:	9/13/2013
BORING NO.:	S0031R
SAMPLE NO.:	MC13-1 Depth(61'-61.5')
DESCRIPTION:	Fine Sand (SP)

Cohesive Pressure, psf	100
Internal Friction Angle	38

SPECIMEN	A	B	C	D	E
DRY DENSITY (pcf)	100.9	100.9	100.9	---	---
INITIAL WATER CONTENT (%)	17.8	17.8	17.8	---	---
FINAL WATER CONTENT (%)	22.20	21.90	21.30	---	---
NORMAL STRESS (psf)	4261	8497	13009	---	---
NORMAL STRESS (psi)	30	60	90	---	---
MAXIMUM SHEAR (psf)	3519	6565	10353	---	---

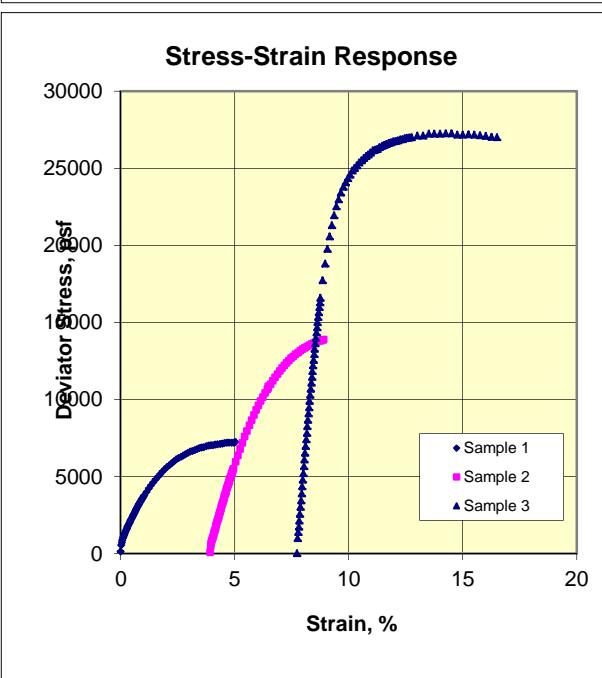
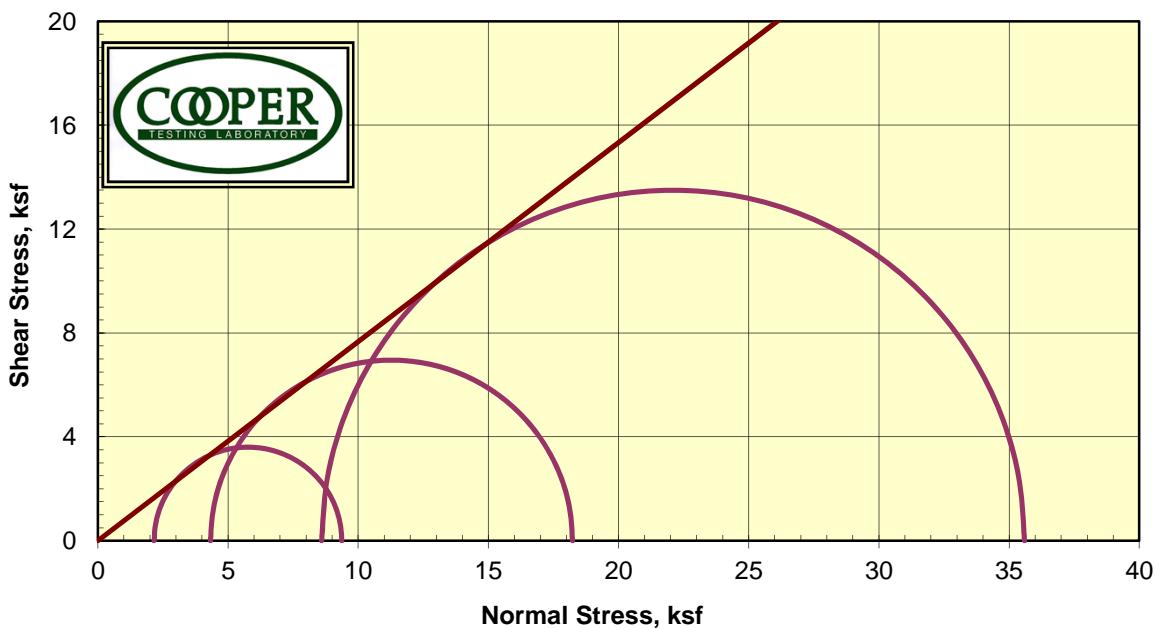
Engineering Materials Laboratory

4539 N. Brawley #108, Fresno, CA 93722

559-276-9311

Triaxial Consolidated Drained

ASTM D7181-11m



Job No.: 824-001 **Date:** 9/20/2013

Client: Technicon **BY:DC**

Project: 23502-259

Sample: S0031R @ 11-11.5' Pale Yellow SAND, trace silt

Remarks: ** Staged Test - the staged procedure is not recognized by ASTM D7181-11.

Strengths picked at 5% strain. Due to some soil loss during tear down the MD data should be considered approximate.

Stage	1	2	3
MC, %	9.4		
Dry Dens., pcf.	101.2		
Sat. %	38.2		
Void Ratio	0.665		
Diameter in	2.42		
Height, in	5.00		
Final			
MC, %	23.7	23.4	23.0
Dry Dens., pcf.	102.7	103.6	104.8
Sat. %	100.0	100.0	100.0
Void Ratio	0.641	0.631	0.622
Diameter, in	2.42	2.44	2.48
Height, in	4.96	4.81	4.62
Cell, psi	105.4	120.0	149.8
BP, psi	90.5	90.0	89.3
Effective Stresses At:			
Strain, %	5.0	5.0	5.0
Deviator ksf	7.21	13.91	27.00
Volumetric Strain	-0.29%	-0.63%	-0.06%
Sigma 1, ksf	9.371	18.232	35.593
Sigma 3, ksf	2.161	4.327	8.597
P, ksf	5.766	11.280	22.095
Q, ksf	3.605	6.953	13.498
Stress Ratio	4.336	4.214	4.140
Rate in/min	0.0004	0.0005	0.0005
Effective C	0.0		
Effective Phi	37.5		

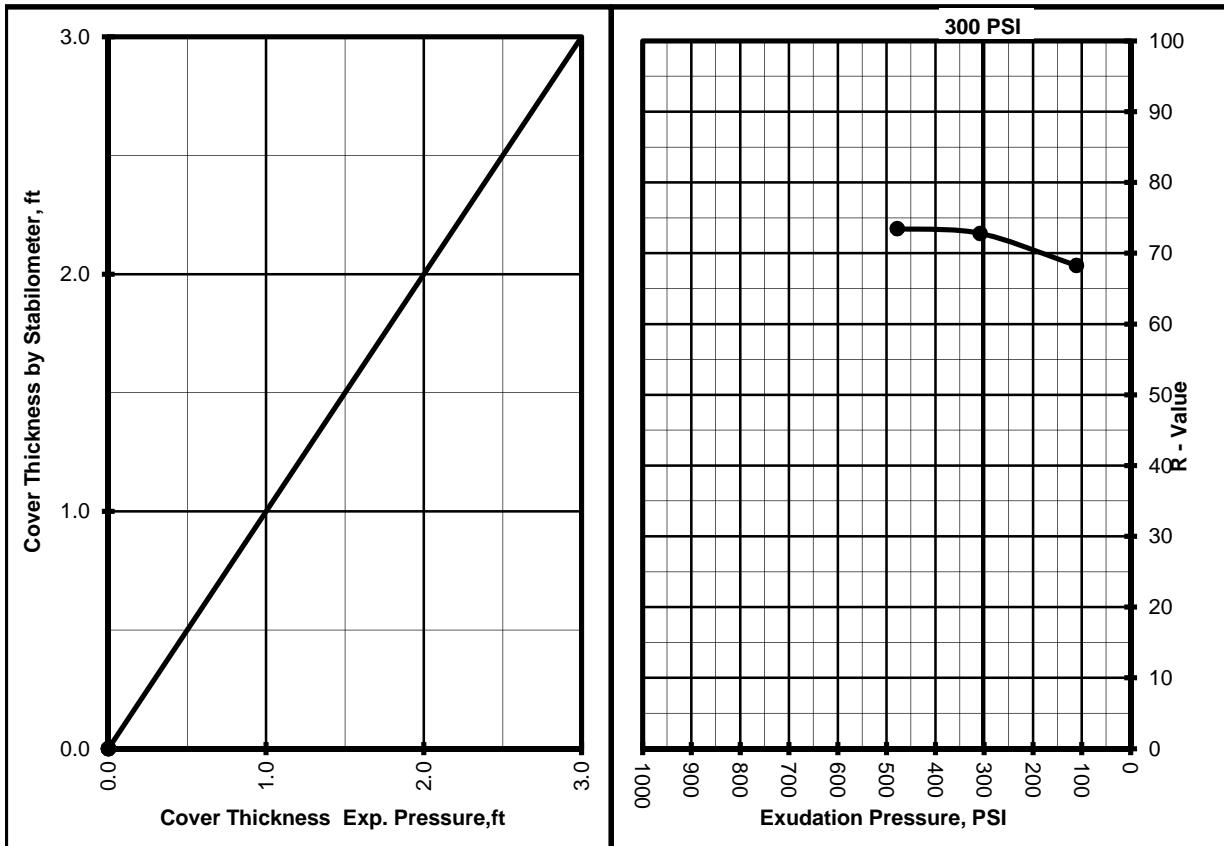


TECHNICON
 ENGINEERING SERVICES, INC.
R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number : 23502-ZS9
 Project Name : CA HSR FRE_BAK
 Date : 9/12/13
 Sample Location/Curve Number : Boring S0031R,B-1 @ 0-5'
 Soil Classification : SM

TEST	A	B	C
Percent Moisture @ Compaction, %	9.6	10.1	9.3
Dry Density, lbm/cu.ft.	120.5	118.3	120.2
Exudation Pressure, psi	308	111	478
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	73	68	73

R Value at 300 PSI Exudation Pressure	(73)
R Value by Expansion Pressure (TI =): 5	Expansion Pressure Nil

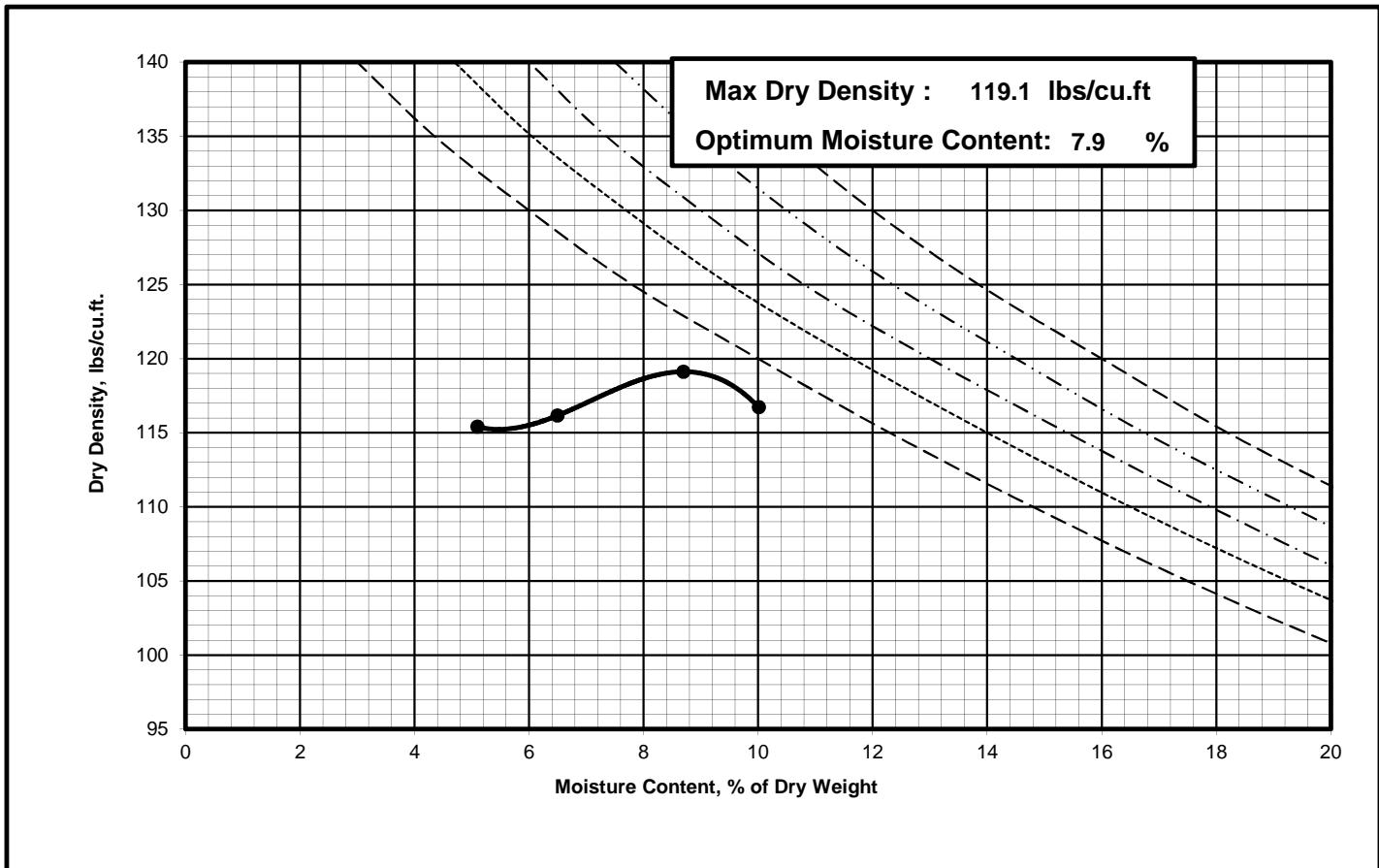


Laboratory Compaction Curve

ASTM D - 1557

Project Number : 23502-ZS9
 Project Name : CA HST - Fre_Bak
 Date : 9/9/2013
 Sample location : Boring S0031R
 Sample/Curve Number : B-01
 Soil Classification : SM - Brown
 Test Method : 1557C

	1	2	3	4
Weight of Moist Specimen & Mold, gm	6983.9	7066.5	7262.8	7226.1
Weight of Compaction Mold, gm	2858.0	2858.0	2858.0	2858.0
Weight of Moist Specimen, gm	4125.9	4208.5	4404.8	4368.1
Volume of mold, cu. ft.	0.0750	0.0750	0.0750	0.0750
Wet Density, lbs/cu.ft.	121.3	123.7	129.5	128.4
Weight of Wet (Moisture) Sample, gm	200.0	200.0	200.0	200.0
Weight of Dry (Moisture) Sample, gm	190.3	187.8	184.0	181.8
Moisture Content, %	5.1	6.5	8.7	10.0
Dry Density, lbs/cu.ft.	115.4	116.2	119.1	116.7





California Bearing Ratio

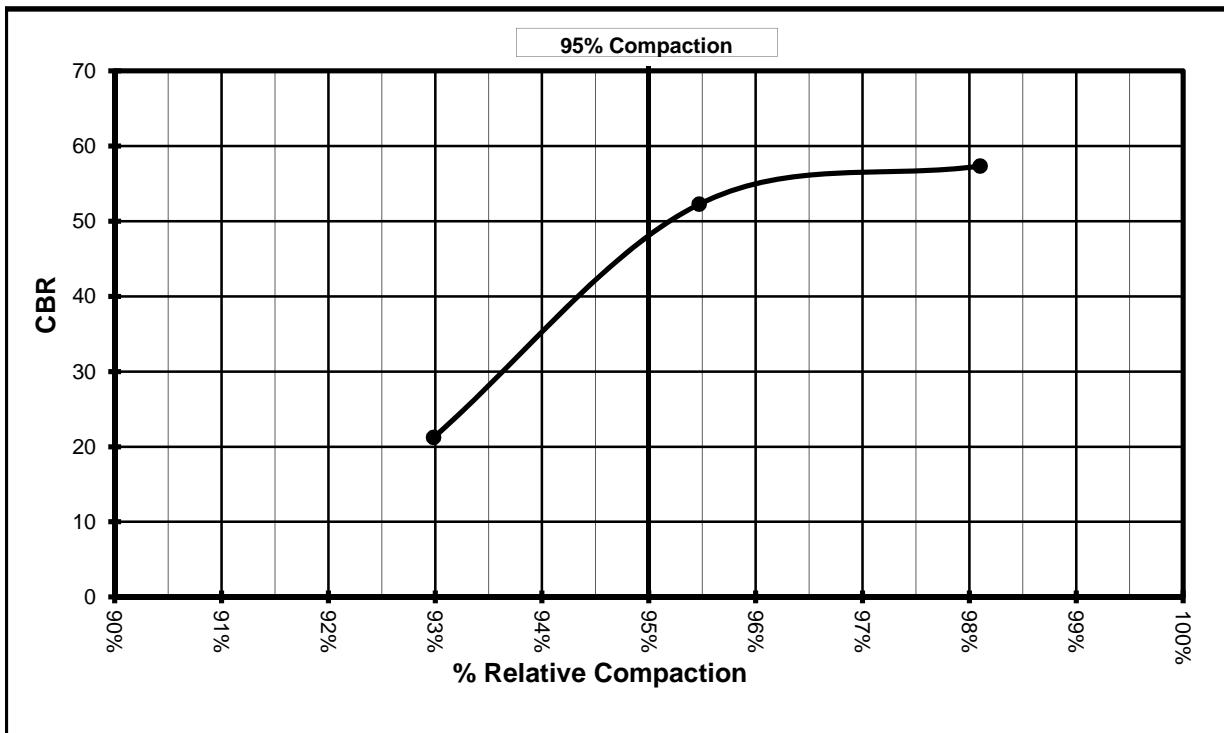
ASTM D - 1883

Project Number : 23502-ZS9
Project Name : CA HST - Fre_Bak
Date : 9/20/13
Sample Location/Curve Number : B-01
Sample Location/Curve Number : S0031R
Soil Classification : SM - Brown
Method of Compaction : ASTM D 1557

TEST	A	B	C
Max Dry Density @ Optimum, lb/cu.ft.	119.1	119.1	119.1
Percent Moisture as Compacted, %	10.6%	10.3%	10.4%
Dry Density, lb/cu.ft.	116.8	113.7	110.7
Percent Relative Compaction. %	98.1%	95.5%	93.0%
Surcharge Weight, lb	10	10	10
Percent Moisture @ Testing %	11.4%	11.5%	11.5%
Penetration Depth Check, in	0.50	0.49	0.48
Load @ 0.100" Penetration, lb	167	285	124
Stress @ 0.100" Penetration, psi	241	284	40
Swell During Saturation, %	0.13%	0.13%	0.13%
CBR Value	57	52	21

CBR @ 95% Relative Compaction

48



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